AECOM

Standard Operating Procedure
Lower Passaic River Restoration Project

Water Column Profiling

Procedure Number: LPR-FI-05

Revision No.: 2

Revision Date: July 2011

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Annual review of this SOP has been performed and the SOP still reflects current practice.

Initials: _____ Date: _____
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Standard Operating Procedure
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Contents

1.0 Scope and applicability

1.1 This project Standard Operating Procedure (SOP) defines the procedures for the collection of water column profile data in the Lower Passaic River Study Area and the Newark Bay Study Area as part of the Lower Passaic River Restoration Project (LPRRP) using a multi-parameter datasonde from a boat or other sampling platform.

1.2 This SOP assumes that water column profiling is associated with surface water sample/data collection activities; refer to SOPs LPR-FI-04 and LPR-FI-06, or as specified in the Quality Assurance Project Plan (QAPP).

1.3 This SOP has been prepared based on the use of a YSI™ 6820 V2, but an equivalent instrument can be used and the principles of this SOP applied to its use.

1.4 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the Project Quality Assurance (QA) Manager and the Task Manager and communicated to the Cooperating Parties Group (CPG) Project Coordinator and the United States Environmental Protection Agency (USEPA) Remedial Project Manager (RPM). Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and safety considerations

2.1 The health and safety (H&S) considerations for the work associated with this SOP, including physical, chemical, and biological hazards are addressed in the site-specific Health and Safety Plan (HASP) and associated addendums (MPI 2005a; MPI 2005b; AECOM 2011). The major H&S considerations for the work associated with water column data collections are the marine safety aspects of the program.

2.2 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risk areas covering every aspect of the work to be completed. Weather conditions are often part of these discussions. As detailed in the HASP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are fully remedied to the satisfaction of the SSO.

3.0 Interferences

3.1 Ensuring that the in-situ sensors are and clean will reduce interference risks. Floating debris may foul the instrumentation and regular checking during measurements is needed to ensure that sensors are not blocked.

3.2 Ensuring that the in-situ sensors are maintained properly will help reduce interference risks related to these data collection efforts and also prevent sensors from becoming corroded.

3.3 Proper calibration of the instrument is necessary to ensure accurate data. Refer to Section 5.2 of this SOP for calibration procedures.

4.0 Equipment and materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Multiparameter datasonde with turbidity sensor (YSI™ 6820 V2 or equivalent)
- EcoWatch™ data logging software or equivalent
- Connective (serial) cabling
- Sufficient memory capacity for the survey
- Weight bearing line/cable and anchor weight. Greater than 50 feet of line may be required for the deepest areas of Newark Bay.
- Field laptop computer
- Calibration solutions
- Chemical-free wipes
- Tap water supply
- Plastic tape
- Approved plans, including target locations
- Manufacturer's operating manual
- Replacement batteries
- Survey vessel fitted with differential global positioning system (DGPS) navigational equipment (SOP LPR-G-02) and a fathometer
- Safety gear (work vests, HASP specified personal protective equipment [PPE])

5.0 Procedures

5.1 Datasonde Instrument Set-Up

Fasten the pump tubing for water sample collection (SOP LPR-FI-04) to the multiparameter datasonde, avoiding any obstruction to the turbidity sensor. Attach the datasonde and the tubing inlet to the weighted deployment line at approximately 3 feet (ft) above the anchor weight. The tubing and the sensor cable should then be fastened (with cable ties) to the weighted deployment line at regular intervals over the entire length. Sensors should be inspected for cleanliness and to ensure they are free of corrosion.

Install the instrument batteries and data logging software according to the instrument-specific operating manual. A new logging file should be created for each profile to aid in data tracking. Refer to QAPP Worksheet #27 for the profile naming conventions. The data logging system should then be set up to log data every second unless otherwise specified in the QAPP.

5.2 Calibration

The datasonde should be calibrated daily before initiating water column profile data collection according to Section 2.6 of the manufacturer's operation manual (YSI 2009).

5.3 Deployment/Field Data Collection

5.3.1 Navigate to the station of interest using the navigational procedures outlined in SOP LPR-G-02 – Navigational Positioning.

5.3.2 Deploy the datasonde and attached sampling tube and begin water column data profiling as outlined in the QAPP.

Profile collection from a boat: At the station of interest, the datasonde (and sampling tubing) should be lowered through the water column until it is 3 ft off the bottom as determined by the shipboard fathometer. If the operator "feels" the bottom with the weight, the instrument should be raised and data collection delayed to allow any resuspended sediment to dissipate as determined by monitoring real-time turbidity readings. The anchor weight should be kept suspended above the bottom sediment. Based on the water depth provided by the datasonde, field technicians will determine the water column structure and define the desired depths for data and sample collection. The datasonde should be allowed to equilibrate at bottom depth for at least one minute (or until readings for all parameters stabilized) before beginning profiling.

Field technicians will then create a new logging file for that station/profile according to QAPP naming conventions (QAPP Worksheet #27) and initiate data logging. The datasonde will then be slowly retrieved by hand at a rate of approximately one foot per second, per the manufacturer's specifications for the response time of the sensors, as indicated by the real-time display in EcoWatch™. Fixed point measurements will be collected at each sampling depth. Once the initial profile is complete field technicians will return the instrument package to the sampling point and conduct water sampling according

to SOP LPR-FI-04. The datasonde will continue to log data throughout the sampling activity. After the conclusion of all sampling at a station a second profile will be collected in the same manner as the first in order to document any changes in the water column.

Profile collection from a bridge or shore point: At the station of interest, the field team should lower the datasonde (and sampling tubing) through the water column until the probes and tubing inlet are completely submerged and at least 3 inches below the water surface. If the instrument package makes contact with the bottom profiling should be delayed for 5 minutes to allow for any suspended sediments to dissipate as confirmed by monitoring real-time turbidity readings. The datasonde should be allowed to equilibrate at sample depth for at least one minute (or until readings for all parameters stabilized) before beginning profiling.

Field technicians will then create a new logging file for that station/profile according to QAPP naming conventions (Worksheet #27) and initiate data logging. Due to the shallow water depth at bridge sampling stations (1-2 ft), data will only be collected at a single depth for in-situ parameters as defined in QAPP Worksheet #18. Once the initial in-situ measurements are complete field technicians will conduct water sampling according to SOP LPR-FI-04. Data logging will continue for the duration of sampling activities in order to document any changes in the water column.

6.0 Quality assurance / quality control

6.1 It is the responsibility of the Field Task Manager (FTM) or designee to check the instrument calibration/test information, to spot check adherence to the procedural requirements of this SOP, and to review the associated documentation for accuracy and completeness.

6.2 Newly acquired profile data should be reviewed for reasonableness by the FTM or designee before moving off station.

7.0 Data and records management

7.1 Field records will be generated and maintained as outlined in SOP LPR-G-01 – Field Records and in the Lower Passaic River (LPR) Data Management Plan (DMP) [AECOM 2010, or current version]. These documents cover all aspects of collection including chronology of events, station locations, time/date, sampler name, and data collected.

Instrument check/test records including sensor calibration records will be maintained in the field logbook.

7.2 During water column profiling in-situ data will be captured on a laptop PC using EcoWatch™ data acquisition software. In addition, field technicians will record profile information on the In-situ Data Log, Attachment 1 to this SOP. Acquired data will be downloaded on a daily basis as an EcoWatch™ file and then exported as an excel spreadsheet to the AECOM Data Management Task Manager at the conclusion of the survey for permanent storage as specified in the DMP (AECOM 2010, or current

version).

Data files recorded by the instrument will be tracked by date/time stamp and profile naming convention (refer to QAPP Worksheet #27). The field laptop time/clock should be checked at the start of the survey against an accurate source (e.g., cell phone or DGPS time stamp) to ensure accurate time synchronization for these tidally sensitive data.

7.3 Field data will be maintained and distributed to the appropriate personnel as described in the LPR DMP (AECOM 2010, or current revision).

7.4 Deviations to the procedures detailed in the SOP must be recorded in the field logbook at the time of occurrence and summarized on the Daily Activity Log (refer to SOP LRP-G-01 – Field Records). A formal nonconformance report (NCR) will be completed (refer to SOP LRP-G-01 – Field Records) and distributed as specified in the QAPP.

7.5 All records associated with the activities described in this SOP will be ultimately maintained in accordance with the Lower Passaic River Quality Management Plan (AECOM 2009).

8.0 Personnel qualifications and training

The individuals executing these procedures must have read, and be familiar with, the requirements of this SOP and the corresponding LPRRP plans (e.g., HASP, QAPP, DMP, and FSP). Water quality data collection is a relatively simple procedure requiring minimal training. However, initial instrument calibration and sample/data collections should be supervised by the FTM or designee.

9.0 References

AECOM 2009. Quality Management Plan, Lower Passaic River Restoration Project, CERCLA Docket No. 02-207-2009. September 2009 or current version.

AECOM 2010. Lower Passaic River Data Management Plan. July 2010 or current version.

AECOM 2011. Lower Passaic River Restoration Project, Remedial Investigation, Health and Safety Plan Addendum. June 2011 or current version.MPI 2005b. Lower Passaic River Restoration Project Health and Safety Plan Final Addendum – Sediment Coring. July 2005.

YSI 2009. 6-Series Multiparameter Water Quality Sondes. September 2009 or current version. http://www.ysi.com/resource-library.php

10.0 Revision history

Revision	Date	Changes
0	June 2010	NA
1	September 2010	Minor revisions throughout document
2	July 2011	Minor revisions throughout document

Attachment 1. In Situ Data Log

Program: _____ ***Survey Name***_____

Recorded By: _____ ***Survey Date***_____

Location/Profile	Time* EST__EDST__		File Name(s)	Comment
	Start	End		

*Record as 24-hour; Check either Eastern Standard Time or Eastern Daylight Savings Time (EST/EDST).